It is therefore possible to choose the parameters such that *d* is maximized, providing maximum spectral purity clearance about the desired frequency *sq+r*.

Figure 8. shows an embodiment of the rational synthesizer with a PLL using six way commutator with a non-square wave pattern, designed specifically to offer better second order spectral purity. It also incorporates a differential DSB mixer for applications requiring high frequency mixing and further incorporates a differential phase detector PD which permits the propagation of the symmetry into the differential low pass filter.

What is claimed is:

1. A method for rational digital synthesis comprising the steps of

providing a periodic pattern signals

feeding said periodic pattern signals to an *N* way commutator

clocking the periodic pattern generator at a frequency f1; and

crotating the commutator at a frequency f2, therby obtaining an output frequency of f1+/- f2.